

Specifications for a
Model THREE Room
School Building

STATE OF MAINE
EDUCATIONAL DEPARTMENT

SPECIFICATIONS

FOR A

MODEL THREE ROOM SCHOOL BUILDING

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MILLER & MAYO
// **ARCHITECTS**
PORTLAND MAINE.

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SPECIFICATIONS.

Of the labor and materials required in the erection and completion of a *Model Three Room School Building*, in accordance with the drawings which accompany this specification, and under the direction of a superintendent duly authorized.

GENERAL CONDITIONS.

All the work described in these specifications or shown on the drawings, and all the work necessary for the perfect completion of the work so described or shown, is to be executed in a thoroughly substantial and workmanlike manner.

All work and materials are to be of the best description unless otherwise herein distinctly described.

All the work shown on the drawings is intended to be correct according to the scale at which the drawing is made; but in case of any discrepancy in the figures the superintendent shall be called upon for his decision before the work involved is undertaken, and the contractor shall be liable for any extra expense incurred unless this precaution is complied with, but figured dimensions and detail drawings are in all cases to be followed though they differ from the scale measure. Any work constructed not in accordance with the detail drawings must be removed and replaced at the contractor's expense.

The contractor is to give his personal superintendence and direction to the work, and he is to furnish all transportation, labor, materials, scaffolding, and appliances needful for performing his work in the best manner, according to the true intent and meaning, either expressed or implied, of these specifications and the drawings which accompany them.

In the absence of the contractor, notices or instructions given to the foreman in charge, shall be considered the same as if given to the contractor.

The contractor shall be responsible for any accidents resulting from either contract or extra work under his charge; make good any damage, injury, or delay caused by him to other contractors, or to the person and property of the public, which he or his workmen may occasion.

The contractor shall at all times cover and protect his work and the materials to be used therein, from injury by the weather or otherwise, and shall repair and make good any damage thus occurring.

The contractor is at his own expense to amend and make good any defects from settlements or other faults in his work due to defective or improper materials or workmanship, which may appear within twelve months after the completion of the building.

The contractor is to do all the work necessary for the perfect completion of his work, rectify any failure resulting from it, and maintain firm and secure the whole of it, including alterations and additions should any be made.

The fact that any defective materials or labor have been overlooked or unseen by the superintendent during his various visits shall have no bearing on the final settlement.

The contractor shall not make sub-contracts except with parties satisfactory to the owner.

The contractor is at all times to carry on his work with all expedition consistent with thorough and good workmanship.

The contractor shall remove all dirt and rubbish resulting from his work, from time to time, and shall make the premises neat and tidy.

No bills for alterations or additions will be allowed unless the same be ordered in writing at a price agreed upon before the work involved is undertaken.

SURVEY.

The contractor shall employ a competent engineer to put up the benches for the corners and angles of the building and give him all necessary levels during the construction of the work. The contractor shall be held responsible for the correctness of the same.

EXCAVATION.

Excavate the entire space covered by the building, to the depth indicated on the plans and shown by the various sections. The excavations to extend beyond the walls to a sufficient distance to allow the same to be seen and left open until the work is accepted. Excavate for all footings so that they shall come below the cellar bottom. Excavate for the rollway. Excavate for the foundation for the porch and outside steps, to extend down 4 feet below grade. The material from the excavations required for the sub-grading shall be dumped on the lot as directed. Any superfluous material not required for the sub-grading shall be removed from the lot by the contractor.

NOTE: If any ledge should appear in the course of the excavating, any blasting that might be required shall be done at the expense of the owner.

BACK FILLING.

After the walls are built and the mortar has set and the work has been accepted, the trenches shall be back filled with earth taken from the excavations, to be well tamped every foot in height.

CELLAR BOTTOM.

The cellar bottom shall be levelled off with gravel and thoroughly tamped and puddled ready to receive the concrete.

GRADING.

Level off the material from the excavations around the building as may be required. The material from the excavations is to be used for the sub-grading, but the balance of the grading will be done by the owner.

MASON WORK.

CEMENT.

All cement specified hereafter shall be perfectly fresh Portland cement and shall be a brand which has been accepted by the American Society of Civil Engineers.

LIME.

All lime used in the mason work shall be the best Rockland lime. It shall be perfectly fresh and of a brand acceptable to the superintendent.

SAND.

All sand shall be clean and sharp and used in proper proportions as directed.

FOUNDATIONS.

All the foundation walls, including the foundations for the entrance porch and the foundation for the rollway shall be built according to the dimensions given on the plans. The foundation walls shall be built of good, sound, large-sized stone, acceptable to the superintendent. The wall shall be well bonded with headers or through stone running the full width of the wall, and the corners shall be bonded with long stones running into the wall alternately each way. The pinners shall be thoroughly bedded in mortar when they are set, and the interstices shall be filled solid full of mortar to make a full mortar wall. The inside face of the walls shall be smooth faced and perpendicular and the outside surface shall have no prominent projecting stones or cavities. The contractor shall obtain from the superintendent the location of the drain pipes and shall leave openings for the same, and if he omits to do this he shall cut through the walls where it is required at his own expense. Leave any other openings in the walls that may be required. No work shall be covered or concealed until examined by the superintendent. Bottom stones of the foundation to be bedded in mortar. Stones to have good beds and builds and square faces. Top of the walls to be brought up level to receive the

brickwork. The mortar shall be made in the proportion of one cask of cement to one cask of lime. The lime to be slaked at least twenty-four hours before the cement is added. Sand to be added as directed by the superintendent.

FOOTINGS.

Set stone footings of the dimensions shown on the plans under the partition walls, piers, columns and chimney. The top of the footings to be set below cellar bottom. The stones shall be through stones to run the full width in one piece. The footings shall be split for a fairly even thickness and roughly sized on the edges. Leave openings in the footing courses for drain pipes, as directed. All footing stones shall be bedded in mortar.

CONCRETE FLOOR.

The entire basement shall have a concrete floor. Concrete shall be three inches thick and shall be composed of one part Portland cement to three parts of clean, coarse gravel; all to be evenly smoothed and sloped to gutters made in the concrete. Make trenches in the concrete for soil pipes and return steam pipes where required. No concrete shall be laid until the plumbing is completed. Cover the entire concreting with cement mastic to make a smooth job. This mastic shall be mixed in the proportions of one part Portland cement to three parts of sand, to be put down before the concrete is thoroughly set in order that it will not scale.

BRICKWORK.

Build all brickwork shown on the drawings of good, hard, straight, merchantable brick; no soft or light colored brick will be accepted or allowed to remain on the grounds. All brickwork shall be laid in half cement mortar; this mortar to be made in the proportion of one cask of cement to one cask of lime, mixed with sand in proportions as directed; the lime to be slaked at least twenty-four hours before the cement is added. Bricks to be laid to a line. All brickwork to be well bonded together and to have a course of headers every eighth course. All bricks to be thoroughly wet before being laid. Turn ring arches over all door openings. All brickwork to be laid plumb

and true. All outside courses exposed to view to be laid in red mortar. Brick for the outside of the underpinning shall be the best, carefully culled for an even color, and laid straight and plumb with small joints. Brickwork in the basement to be jointed to give a good smooth job. Leave openings in the walls and chimney where required. Carefully point and joint the entire work exposed to view and clean down with diluted acid. Walls shall be kept covered and carefully protected from rain. Furnish and set iron cleanout doors and thimbles in the chimney as directed. Plaster the chimney flues and plaster the chimney outside where not exposed to view. Build in anchor bolts into the rollway walls to secure the wooden combings.

ASSISTANCE.

The mason shall render assistance in cutting and jobbing that may be required by other contractors in connection with the heating and plumbing.

FLASHING.

The mason shall provide and build in sheet lead flashing about the chimney, and in all other places necessary to insure tightness.

IRON.

Furnish and set all the columns in the basement as shown with 8" x 8" plates at the top and 12" x 12" plates at the bottom: plates shall be either screwed to the columns with flanges or shall be cast with hubs to fit into the columns. Columns shall be extra heavy wrought iron pipe columns, turned off true at each end, and shall be of the sizes noted on the plans. Furnish 8" x 12" iron cleanout doors for each chimney flue. Furnish any other iron that may be required.

GRANITE SILLS.

Furnish granite sills for the basement windows. These sills shall have straightened beds, quarry faces and pene hammered washes.

LATHING.

Lath the entire building, including the basement stairways, on the walls and ceilings. Laths to be best spruce laths, free from sap or bark, laid to the thickness of a lath apart; to break joints every eighth lath on the walls and every sixth lath on the ceilings. No perpendicular lathing will be allowed. Lath behind all dado work and behind all blackboards. All lathing to extend to the floors.

PLASTERING.

Plaster all portions lathed as specified heretofore. All plastering to be best two coat work and in all cases to be carried to the floors with proper grounds for all finish, dado, blackboards, etc. Lathing and plastering to fill $\frac{3}{4}$ -inch grounds. First coat to be of the best Rockland lime, clean sharp sand and long cattle hair, mixed to the proper proportions. The lime to be slaked at least ten days before it is to be used. The hair to be wet and threshed and thoroughly mixed in; the hair to be mixed in after the mortar is cool. Use 13 pounds of hair to each cask of lime. The first coat shall be applied in a careful and thorough manner and floated well up to the grounds. All angles shall be clearly defined and all surfaces made smooth. The second coat shall be a skim coat of the best lime putty and clean sharp sand prepared as specified above. Skim coat to be put on without jointings after the first coat is dry. All corners and angles shall be made perfectly plumb and true. No skim coat will be required behind the blackboards and dado. The contractor shall take care of the windows and other openings during the time of plastering, with cloth screens and protect the same from injury. Screens shall be furnished by the carpenter. The contractor shall do all patching necessary after the completion of the carpenter work and shall protect the window sills during the time of plastering and keep them in perfect condition. If any heat should be necessary to dry out the plastering it shall be furnished at the expense of the contractor.

CARPENTER WORK.

FRAMING.

Frame the building in the manner shown with sound, straight, square edged, straight grained, merchantable timber, sawed to the dimensions given on the plans. Use hard pine timber where so indicated on the plans. The frame to be put together in the firmest manner well pinned and spiked.

IRON WORK.

The carpenter shall furnish all bolts, rods, straps, and any other iron which may be reasonably required for the perfect completion of the framing.

BRIDGING.

Bridge the floors as shown. To be cut in double, herring bone fashion, and to run in a continuous line and well nailed, when the beams are put in position, with ten penny nails. The bridging shall be 2" x 3".

UNDER FLOORS.

Lay under floors throughout the building with good, merchantable $\frac{7}{8}$ " floor boards, free from large or loose knots and shake, mill planed on one side and thoroughly nailed at every bearing with ten penny nails. Headings to run by. Boards may be either spruce or hemlock.

WALL AND ROOF BOARDING.

Boards on the walls and roof shall be good, merchantable $\frac{7}{8}$ " covering boards, free from large or loose knots and shake, mill planed on one side, laid close and firmly nailed with ten penny nails. Boards may be either spruce or hemlock.

OUTSIDE STUDDING.

Outside studding shall be 2" x 6" and placed for four nailings to a lath. To be well spiked at head and foot.

INSIDE STUDDING.

Inside studding to be 2" x 6"; to be double and trussed at the doors, set for four nailings to a lath, carefully straightened, well nailed at head and foot and capped with 4" x 6" hard pine partition cap. All to be bridged three times in the height with block bridging.

FURRING.

Furring strips for ceilings to be $\frac{7}{8}$ " x $2\frac{1}{2}$ ", set for four nailings to a lath, well levelled, straightened, and thoroughly nailed at every bearing with ten penny nails. Do all other furring necessary.

GROUND.

Put in $\frac{3}{4}$ " grounds about all doors, windows, under the bases, and dado, behind the blackboards, and wherever necessary to make good and firm work.

ANGLE BEADS.

Put up metal angle beads where required. To be of a make which is acceptable to the superintendent. They shall be put up straight and plumb and in one piece.

CLAPBOARDS.

All walls shall be clapboarded. Clapboards to be clear spruce, laid not over four inches to the weather and well nailed with five penny cut box nails. The entrance porch railings to be clapboarded both inside and outside. Clapboards shall be mitered on all corners as shown.

SHINGLES.

Cover all roofs with clear cedar shingles. To be laid 5" to the weather and well nailed with cut nails. Valleys to be laid close. Hips to be double shingled "Boston" hips as shown.

FLASHING.

Do all flashing against and over all doors, windows, around the edge of the ventilator roof, and in all other places necessary to insure tightness, with best heavy zinc and lead. Chimney to be flashed by shingling in wide flashing to turn up under the lead flashing of the mason. Valleys to have wide zinc flashing. Building to be warranted tight for one year.

SHEATHING PAPER.

All the walls shall be covered with the best heavy rosin sized sheathing paper of a brand acceptable to the superintendent. Sheathing paper to be well lapped and to run well under all finish.

OUTSIDE FINISH.

All the outside finish shall be good, merchantable Eastern pine stock acceptable to the superintendent; small tight knots will be allowed. Finish to be thoroughly seasoned, worked according to details, strongly put together and immediately primed. To be left smooth with all nails set. No finish to be put up unless thoroughly dry and in dry weather. The outside casing for the windows to be $1\frac{1}{4}$ " thick.

PORCH.

Porch ceiling to be clear North Carolina pine sheathing; to be mill planed, matched and beaded; in narrow even widths; to be well seasoned and thoroughly blind nailed. Ceiling to have a heavy bed moulding around the edge. The porch to have floor and steps of good quality, rift, hard pine, $\frac{7}{8}$ " thick. Floors to be in 4" widths laid open and well nailed. Steps to have moulded nosings. Steps to be framed on plank stringers bearing on brick piers at the bottom and firmly secured. All finish to be made according to details.

WINDOW FRAMES.

All the window frames shall be made strictly according to details, of clear pine stock with pulley stiles and parting beads of hard pine. All pulley stiles to be $1\frac{1}{8}$ " thick. All frames

shall be made with weight pockets and the stiles to be fitted with 2" bronzed faced steel axle pulleys. The windows in the school rooms shall have two sets of double hung sash in each frame; other windows to have one set of double hung sash in each frame. Window frames shall have outside casings $1\frac{1}{4}$ " thick. Cellar window frames shall be furnished by the carpenter. All frames to be primed as soon as made and protected from injury after being set. Pulley stiles to be oiled when made.

SASH.

All sash to be made in first class manner of best quality thoroughly seasoned pine, coped and lipped at the meeting rail. To be hung with a good quality sash cord and round cast iron weights to properly balance the sash. All sash to have heavy meeting rails and $2\frac{3}{4}$ " bottom rails. There will be two sets of sash, double hung, in each frame, in the school rooms. Furnish double sash for each frame in the basement; basement sash to be hung to tip in, with hinges and fastenings complete. All sash shall be primed with white lead on the outside and stained and shellaced on the inside as soon as made.

GLASS.

All glass shall be American glass of the best grade, free from imperfections. Glass to be bedded in putty and firmly pinned into the sash. The windows in the girls' basement and boys' basement shall be glazed with maze glass.

DOOR FRAMES.

All door frames shall be made of clear North Carolina pine. Frames to be rebated plank frames. Frames to be made of thoroughly seasoned stock; to be set plumb and firmly secured.

DOORS.

All doors shall be clear cypress. Doors to be of the size, thickness and style shown by the drawings. Inside doors shall have five panels and will be moulded on both sides. Outside entrance door will be special style and will have raised mouldings and glass panel as shown. All doors shall have hard wood rubber mounted bunters.

UPPER FLOORS.

Lay upper floors throughout the building. The upper floors shall be clear birch. The floor boards shall be $\frac{7}{8}$ " thick, planed, matched in $2\frac{3}{4}$ " widths, thoroughly kiln dried, laid butt joints and thoroughly blind nailed. All heading joints to run by and to be cut plumb and square. No short lengths will be allowed. All the upper floors shall be planed and scraped to a uniform surface for first class work. Protect the floors, after they are laid, with building paper.

FLOOR FELT.

Furnish and lay heavy floor felt between all upper and under floors. This felt shall be of a brand which is approved by the superintendent.

INSIDE FINISH.

All the inside finish throughout the building shall be clear North Carolina pine; to be thoroughly kiln dried, worked according to details and put on in a thorough and workmanlike manner, neatly and securely fastened and in one piece where possible. All finish to be sandpapered with the grain to a smooth surface.

STAIRS.

Build all the stairs as shown on the plans with $2\frac{1}{2}$ " plank stringers, about 12" apart, put up in the most thorough manner. All the stairs will have $\frac{7}{8}$ " hard pine risers, and $1\frac{1}{8}$ " clear birch treads with nosings. Posts and rails shall be clear North Carolina pine. Posts to be 5" x 5" with paneled sides and neat moulded caps. Rails will be moulded from heavy stock and will be rebated to receive the sheathing, the sheathing under the rail to be moulded to correspond with dado and to have moulded skirting boards on the outside. Each run of stairs shall have moulded wall rails hung on heavy bronzed metal brackets of approved pattern.

DOOR FINISH.

All doors shall have moulded architraves with heavy back bands $1\frac{3}{4}$ " thick.

WINDOW FINISH.

All windows shall have moulded architraves with heavy back bands $1\frac{3}{4}$ " thick. To have stool caps with moulded aprons under.

DADO.

All the rooms throughout the building, all the corridors, all the stairways, including the basement stairs, shall have a dado. In all the school rooms the dado will run to the height of the blackboards, where they occur, and to the height of the window stools around the remainder of the room. The teachers' room, all corridors, stairways, and closets shall have a dado four feet high. All the dado will have a plain bevelled base to show 8" above the upper floor and to run down through to the under floor, and will be made up of clear North Carolina pine sheathing $\frac{1}{2}$ " thick (full thickness after it is milled) in 3-inch widths, with the faces moulded strictly according to the detail. Dado coming under blackboards will be capped by the chalk rail; and the remainder of the dado in the school rooms will have a cap like the window stool finish. All other dado will have a moulded cap about 6" wide.

BLACKBOARD FINISH.

Provide and set a moulded chalk rail with a three-inch moulded surbase at the bottom of the blackboards. The cap over the blackboard will have a freize about 8" wide capped with a moulding.

BOOK CLOSET.

The book closet will be fitted up with shelving as directed by the superintendent.

PICTURE MOULDING.

Provide and put up 2-inch picture moulding in all the school rooms.

COAT SCREENS.

Build coat screens in the corridors where indicated on the plans. Set 3" x 3" posts to run down through the under floors to the bottom of the floor timbers and to be firmly spiked. These posts will be cases made with 1/2" stock. Between the posts will be a wide wood base with a cap on top, above the base open panels of heavy wire work with steel frames, surmounted with a wide wood frieze with moulded cap; all to be about 5'-6" high.

BASEMENT WATER CLOSETS.

Contractor shall build the screens for the basement water closets as indicated, of clear North Carolina pine. These screens will be stilted somewhat from the floor and will be constructed of 7/8" sheathing in 3" widths, planed and beaded on both sides. The screens will have grooved bases to take the sheathing and will have neat moulded caps around the tops. Contractor to supply the door frames and doors for these closets.

HANGING STRIPS.

Provide and put up neat moulded hanging strips about 6 inches wide entirely around each coat room, and put on the wardrobe hooks.

SLATE BLACKBOARDS.

The contractor shall furnish and set slate blackboards where indicated on the plans. Blackboards to be 3 1/2 feet high and the slabs of slate are not to be less than 4 feet each in length, unless necessary on account of the space, and the pieces in each bay must be equal in length. Slate shall be 3/8" thick and shall be "Bangor" stock or equally as good and acceptable to the superintendent. All surfaces are to be finished in the most perfect manner. All joints and corners are to be squared, closely fitted and evenly ground. Set the blackboards in cement. All to be carefully jointed, firmly bedded, thoroughly secured to the walls and left in perfect condition on completion.

NEAT HARDWARE.

An allowance of sixty (\$60.00) dollars will be made for the neat hardware which is to be selected by the superintendent. This allowance is to be paid by the contractor. This hardware includes only the locks, knobs, escutcheons, hinges, etc., for the doors, the window fasteners and lifts, and wardrobe hooks.

SCREENS.

When required, furnish cloth covered screens for the windows while the building is being plastered.

ASSISTANCE.

The general contractor shall render assistance to other mechanics where reasonably required. Do all cutting, fitting and jobbing that is reasonably required in connection with the heating and plumbing.

ROLLWAY.

Build the basement rollway as shown with heavy cleated doors, and build heavy plank steps for the same.

FIRE ESCAPE.

Furnish and erect the fire escape as shown. It shall be constructed entirely of new wrought iron, and each piece shall be securely riveted or bolted as required. The main supports for the landing and stairs shall be $1\frac{1}{4}" \times 1\frac{1}{4}"$ square. These supports shall extend entirely through the walls and shall be secured on the inside with washers and heavy nuts. These supports shall extend out beyond the outside of the railing for a distance of 5" to support the railing braces. The braces under the main supports shall be $1" \times 1"$ square. They shall be put in at an angle of 45 degrees and shall be firmly secured at the outer end, and the inner end shall set into a cast iron lug secured to the wall. The platforms and landings shall be made up of iron bars $1" \times \frac{1}{4}"$ set 1" apart. These bars shall be rod-~~ded~~ together with 5-16" rods, with iron pipe separators between the bars around the rods. The distance between these tie rods shall not be over 24". These bars on the platforms shall en-

tirely fill the space between the wall and the railing. The stair stringers shall be made of iron 5" x $\frac{3}{8}$ ". Stair treads shall be perforated cast iron $\frac{1}{4}$ " thick with ribs underneath on front and back edges $1\frac{1}{4}$ " deep (over all) and on the ends $1\frac{1}{2}$ " deep scalloped out as directed. The treads shall be firmly bolted and shall be 24" long between the stringers. Treads shall be $7\frac{1}{2}$ " wide. The rise not to exceed nine inches. The railings shall have $1\frac{1}{2}$ " steel angles at the top and bottom, with tee irons set vertical between the panels; the crisscross bars in each panel to be $\frac{1}{8}$ " x $1\frac{3}{4}$ ". The center of each panel to be covered with a round rosette as shown. In every case where the rail angle comes against the walls, they shall be extended through the walls and be bolted to form an anchor. All the iron work shall be painted with two good coats of paint.

PAINTING.

PREPARING THE WORK.

The contractor shall cause all the wood work to be perfectly cleaned before being filled. Putty up all nail heads of the outside and inside finish using care to thoroughly match the putty in all natural wood finish. Sandpaper smoothly and clean out all mouldings and properly prepare all work before applying each coat.

STOCK.

All lead must be the best pure white lead of a brand satisfactory to the superintendent, and all oil shall be the best linseed oil. All varnish and stain shall be as specified and shall be delivered on the job in the original packages for inspection.

PRIMING AND FILLING.

Do all priming, staining and filling as soon as the woodwork is constructed. Prime the window frames (except the hard pine pulley stiles) before they are set. Hard pine pulley stiles shall be thoroughly oiled.

COLORS.

Colors of paints and stains shall be selected by the superintendent.

EXTERIOR FINISH.

Paint all exterior woodwork, including the sashes, but excepting the porch ceiling and entrance door, three (3) coats of lead and oil paint.

CLAPBOARDS.

Paint all clapboards two (2) coats of the best lead and oil paint.

OUTSIDE DOORS AND CEILING.

The outside doors and the porch ceiling shall receive three (3) coats of the best Spar Varnish.

INTERIOR FINISH.

All the inside finish including the doors shall be stained to the satisfaction of the superintendent with some standard stain. After being stained all this finish shall receive three (3) coats of some good interior finish satisfactory to the owner. First two coats shall be rubbed down smooth and the final coat shall be lightly rubbed with pumice and oil for a dull finish.

SASH.

All the sash on the inside of the building shall be stained to match the other finish and then be varnished three (3) coats as specified above.

FLOORS.

All the hardwood floors throughout the building shall receive two coats of the best linseed oil and turpentine. The oil and turpentine to be mixed in the proportion of two parts oil to one of turpentine.

HEATING AND VENTILATING.

SYSTEM.

The school rooms are heated by warm air furnished by heaters set in the basement. The corridors, teachers' room, boys' basement, and girls' basement are heated by direct steam furnished by a cast iron steam boiler set in the basement. The school rooms are ventilated by registers set at the floor level and connected, by separate flues with the roof ventilator, each flue having a 20 ft. steam coil to accelerate the draught.

HOT AIR HEATERS.

Furnish and install as shown two hot air heaters of a make which is satisfactory to the owner. The heaters shall have a capacity which is guaranteed to furnish to each school room 1,200 cubic feet of air per minute and maintain the temperature at 70 degrees Fahrenheit, when the outside temperature is zero. Each heater shall be connected to the chimney with smoke pipe, of the required size, made from No. 24 galvanized iron. The heaters shall be complete in every respect.

GALVANIZED IRON WORK.

Furnish and erect all the galvanized iron work necessary to complete the job. Each school room will have a warm air flue extending from the heater to the top of the register opening. Each school room will have a ventilating flue extending from the floor of each room to the roof ventilator by a separate pipe. There will be a return pipe as shown for rotating the air. Each flue shall have a quarter turn behind each register. All flues shall have dampers as specified under another item. All this galvanized iron work shall be No. 26 gauge, strongly riveted to make a tight job, and firmly secured. All to be made according to detail.

DAMPERS.

Each warm air flue shall have a galvanized iron mixing damper as shown, set in an iron frame and properly balanced; to be controlled by chains running up and out into the rooms

through special brass pulleys; there will be two chains for each room marked "warm" and "cold." Each ventilating flue shall have a damper, operated in an approved manner, so that it may be closed if desired.

REGISTER GRILLS.

The warm air inlets, vent outlets, and rotating register, shall be fitted with grills made of 1-16" x $\frac{3}{8}$ " metal with $1\frac{3}{4}$ " open mesh, quarter twist where the bars cross, with the ends of the bars scrolled. They are to be made on metal angle frames and fastened in place with round head brass screws. The grills shall be finished in bronze.

STEAM BOILER.

Furnish and install a cast iron steam boiler of a standard make which is satisfactory to the owner. Boiler shall be rated for 600 feet of radiation. To be connected with the chimney by a smoke pipe made from No. 24 galvanized iron. Cover the boiler with plastic asbestos, to cover at least one inch thick. Boiler shall be complete in every respect.

PIPING.

Furnish and install all the necessary pipe, valves, and fittings and make all connections with the boiler, radiators, basement ceiling circulations and asperating coils in the ventilating flues. Put in all necessary supply and return pipes, all to be carefully graded, properly proportioned and of ample size to insure quick circulation, and freedom from noise and hammering when in use. All pipe to be of standard sizes and weights, straight and round. All fittings to be made of heavy gray iron, with heavy beads and clean threads tapped to a gauge. All pipe to be supported by strong iron hangers, put up so as to allow for expansion. Use nickels floor plates where the pipes pass through the floor.

RADIATION.

Furnish and set radiators for the corridors and teachers' room, circulations of $1\frac{1}{4}$ " pipe on the ceiling for the boys' base-

ment and girls' basement (60 feet of radiation for each basement), and pipe coils for each ventilating flue (20 feet of radiation for each flue). The sizes of the radiators are noted on the plans. All radiators to be neatly bronzed.

VALVES.

Each radiator and circulation shall have standard radiator valves with unions, and each shall have a standard make globe bottom automatic air valve, and in addition to the automatic valve, each shall have a positive air valve.

PLUMBING.

SOIL PIPE.

Furnish and put in all the soil pipe which is necessary to complete the work. All soil pipe shall be extra heavy cast iron pipe. Connect with the sewer pipe, which will be put in by the owner, at a point 5 feet outside the cellar wall and carry a 4" pipe to the inside face of the cellar wall, at which point insert a 4" running trap with brass screw cover. On the inner side of the trap put in a fresh air inlet of 4" pipe terminating above grade outside the building where directed.

Continue the 4" soil pipe and run branches of 4" pipe to drain every fixture including two cellar drain traps, except that the branches to the sinks will be 2" pipe. The soil pipe shall be continued on up through the building by the teachers' room and up to a point three feet above the roof where directed. Leave Y outlets of proper size for all fixtures. Soil pipe shall be provided with cleanouts at each angle and for every 25 feet of horizontal pipe; each cleanout on the basement floor to have a pipe case with an iron cover. Connect lead wastes in the best manner, using brass ferules. All joints shall be caulked perfectly tight with pig lead and oakum. All pipe shall be firmly secured with strong iron holdfasts.

CELLAR DRAINS.

Furnish and set where directed in the basement, two cellar drain traps with brass screw covers and connect the same with the soil pipe.

COLD WATER SUPPLY.

Connect with the water service outside the cellar wall by a 1-inch galvanized iron pipe. Furnish and connect a stop and waste of proper size with couplings for shut-off at cellar wall. Continue this pipe and branch to the different fixtures with galvanized iron pipe. Each separate set of fixtures shall have a separate branch of 1" pipe. Each branch shall have a separate stop and waste cock. In addition to the branches to the different sets of fixtures there will be a branch to the steam boiler and branches to the two sill cocks.

WATER CLOSETS.

Furnish and set water closet combinations where shown. The bowls shall be heavy vitreous china, syphon action bowls. The tanks shall be oak, lined with 14 oz. soft rolled tinned copper, and fitted with ball cocks and flush valves. The seats to be quartered oak, hung to the bowls with heavy nickel plated bar hangers. All exposed pipe shall be nickel plated. Each water closet shall have a dished slate floor slab. Each water closet shall have a local ventilating pipe, all local ventilating pipes to be united into a large pipe connected with a chimney flue.

URINALS.

Furnish and set up complete a sectional slate urinal as shown. This urinal shall have a floor slab, back, ends, and partings of slate. The floor slab shall be 3" thick dished to a urinal drain. The other slabs shall be 1" thick and five feet high. The partings shall be cut out on the inside at the bottom in the usual manner. The slate shall be black slate finished perfectly smooth, free from all defects. Each section shall be in one whole slab. Urinals shall have a capping slab across the top. Each section of slate shall be rebated together and secured three

times in the height with heavy brass angles and bolts, nickel plated. All holes in the slate work for fixtures, pipes, bolts, etc., shall be cut accurately from diagrams and measurements furnished by the plumber. All slate work shall be set by the contractor and left in perfect condition ready for use. The urinal bowls shall be lip urinals, set low for grammar grade with nickel plated urinal traps. The urinal bowls shall be flushed from an oak tank of the required size; this tank shall be fitted with an automatic adjustable valve (by this arrangement the janitor can flush the bowls automatically at any desired intervals). All exposed piping in connection with the urinals and tank shall be nickel plated brass pipe (iron pipe size).

LAVATORY.

Furnish and set a lavatory as shown. Lavatory shall be porcelain enameled. Supply and waste pipes shall be nickel plated brass pipe, supply pipes to be iron pipe size. Trap shall be a nickel plated non-syphoning trap. Basin cock shall be nickel plated, self-closing, of approved pattern.

SINKS.

Furnish and set two sinks where shown. Sinks shall be porcelain enameled roll rim sinks with integral porcelain enameled backs, supported on metal brackets, to be about 40" long. Each sink shall have two self-closing nickel plated bibbs of approved pattern. Traps shall be non-syphoning traps.

TRAPS.

Every fixture shall be trapped in the best manner. Every trap shall be back vented into the soil pipe above the highest fixture, excepting the lavatory and the sinks which have non-syphoning traps. The soil pipe branches to the water closets in the basement may be trapped at the ends where they enter the main drain, and carried up the full size and tied into the vertical branch to serve as a general back vent.

SILL COCKS.

Furnish and set where directed two sill cocks and connect the same with the water supply by a galvanized iron pipe. Sill cocks shall be of the best pattern, nickel plated. Each sill cock shall have a separate stop and waste.

FITTINGS.

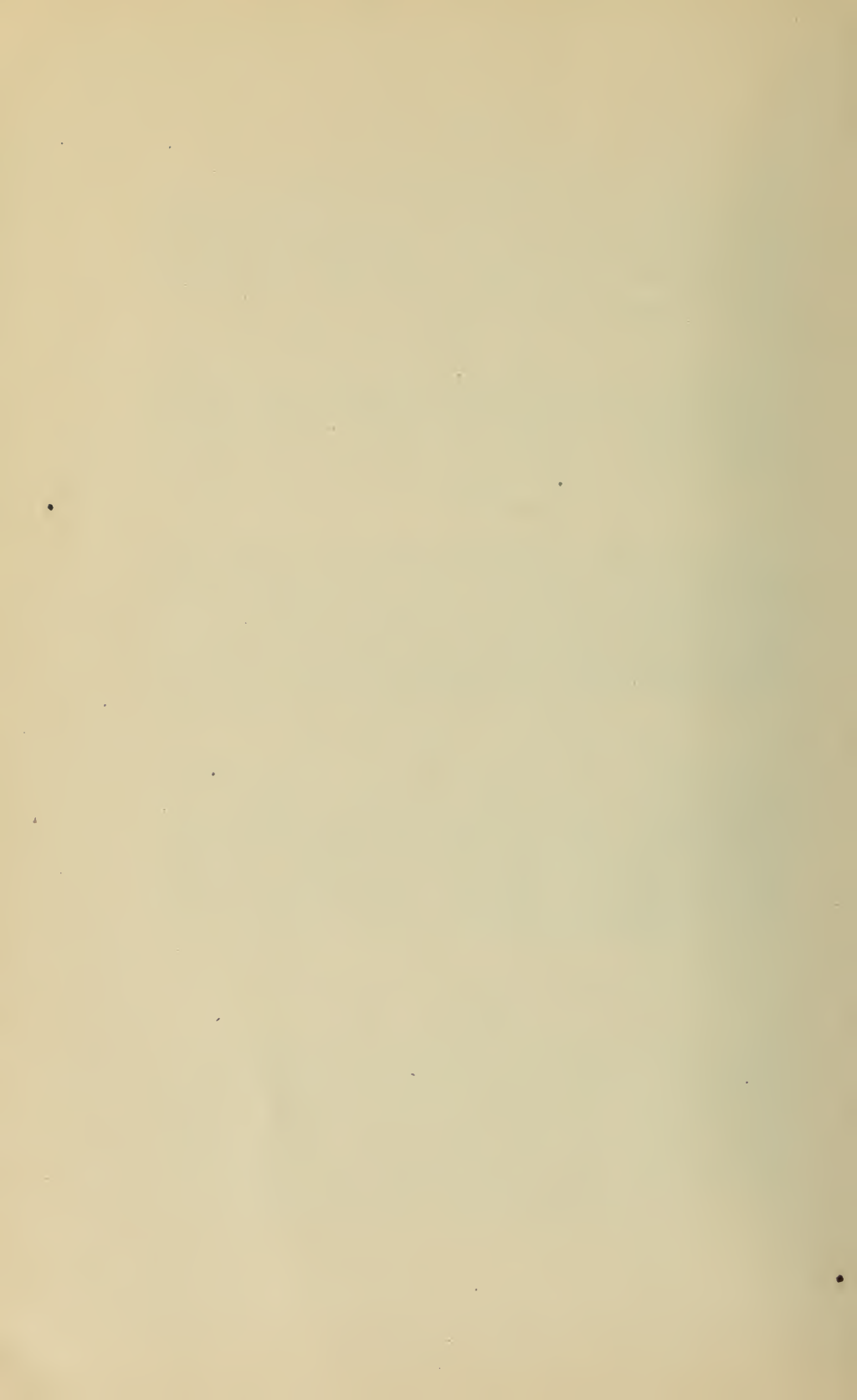
Furnish all pipe fittings and all other fittings required, of the very best quality, to make a perfect job, without any extra charge.

TEST.

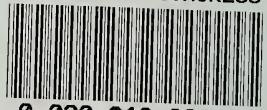
After all the iron soil pipe and waste pipes have been put in and after all branches possible have been connected thereto, the ends shall be sealed up and the piping left filled with water until approved by the superintendent. After the work is completed it will be given either the peppermint or the smoke test and any defects shall be made good before the work is accepted.

EXCAVATING AND CUTTING.

The contractor shall excavate all trenches, refill and tamp the same and remove all superfluous soil from the basement. Cut all openings that may be required in the stone and brick walls, and repair the same after the work is completed. Do all cutting in the woodwork, and repair any plastering that may be broken by installing the fixtures.

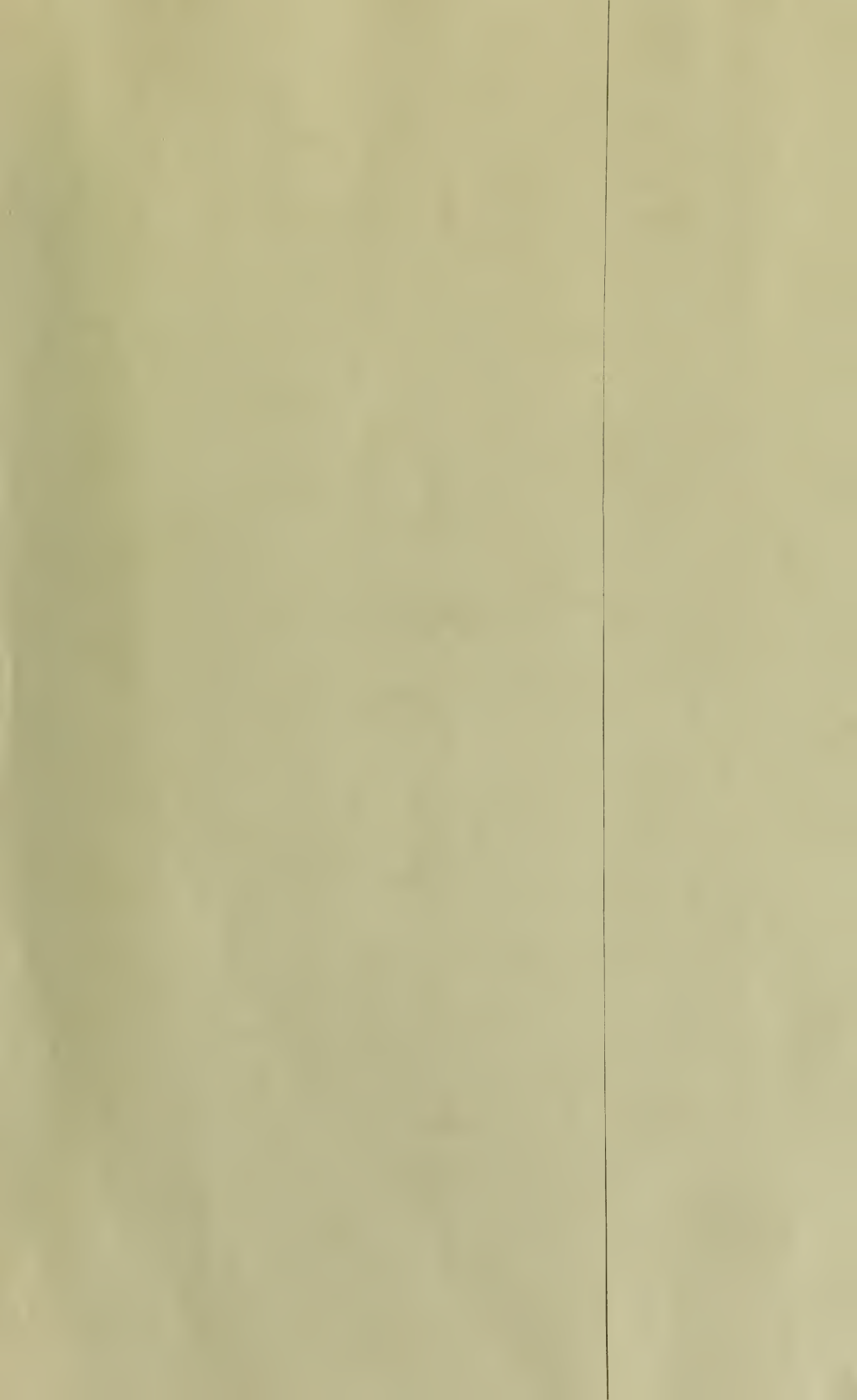


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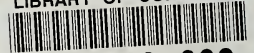


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